

REPORT OF COMPLIANCE SAMPLING INSPECTION (CSI)

AT
Humboldt Wastewater Treatment Facility (WWTF)
Humboldt, NE 68378

NPDES NO: NE-0031844

March 25 – 28, 2024

BY
U. S. ENVIRONMENTAL PROTECTION AGENCY
Region 7
Enforcement and Compliance Assurance Division (ECAD)

INTRODUCTION

I performed a Compliance Sampling Inspection (CSI) at the Humboldt WWTF in Humboldt, NE from March 25, 2024, through March 28, 2024. The inspection was authorized by Section 308(a) of the Federal Water Pollution Control Act, as amended. This narrative report presents the findings of the inspection.

PARTICIPANTS

Humboldt WWTF

Mike Adair, Certified Operator (402) 677-3781
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Josh Chesnut, Non-Certified Operator

U. S. Environmental Protection Agency (EPA)

Joe Heafner, Life Scientist (913) 551-7091
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Zachary Leibowitz, Physical Scientist

PROCEDURES

On March 25, 2024, I arrived at the Humboldt WWTF at 10:30 a.m. and introduced myself to Mr. Chesnut, presented my credentials, and explained the purpose and procedures of the inspection. These procedures included completing the Water Compliance Inspection Report (attachment 1), an EPA Region 7 Biosolids Checklist (attachment 2), a facility walk-through with photos (attachment 3), a check of the self-monitoring records, the collection of influent,

effluent and biosolids samples, and an exit interview.

From March 25, 2024, through March 28, 2024, I used an ISCO model 3710 automatic composite sampler to collect a 24-hour composite sample of the influent after screening. I suspended a weighted length of new Tygon tubing into the influent channel before the comminuter, and I connected the other end to the sampler pump and programmed it to collect evenly spaced aliquots every 30 minutes into a clean Nalgene bottle, which was packed in ice. I returned each day to service the sampler. I removed the bottle, agitated its contents, and poured them into clean, pre-labeled containers for the analysis of Carbonaceous Biochemical Oxygen Demand (CBOD), Non-Filterable Solids (NFS), Ammonia, Total Kjeldahl Nitrogen (TKN), Nitrate+Nitrite, Total Nitrogen (by calculation), and Total Phosphorus (TP). I measured the pH and temperature in a separate grab sample using a field meter.

From March 25, 2024, through March 28, 2024, I used an ISCO model 3710 automatic composite sampler to collect a 24-hour composite sample of the effluent after the Ultraviolet (UV) disinfection system (not currently being used) before effluent discharges through Outfall 001. I suspended a weighted length of new Tygon tubing into the channel and connected the other end to the sampler pump and programmed it to collect evenly spaced aliquots every 30 minutes into a clean Nalgene bottle, which was packed in ice. I returned each day to service the sampler. I removed the collection bottle, agitated its contents, and poured them into clean, pre-labeled containers for the analysis of CBOD, NFS, Ammonia, TKN, Nitrate+Nitrite, Total Nitrogen (by calculation), and TP. I measured the pH and temperature in a separate grab sample using a field meter.

On March 25, 2024, I took several grab samples from the anaerobic digester, mixed the samples together in a teflon lined bucket then composited into one 32-ounce glass jar. The biosolids were analyzed for Metals, including Mercury, percent solids, Total Phosphorus and TKN.

On March 26, 2024, and March 27, 2024, I placed the samples I collected on ice in an ice chest, sealed the container and shipped it overnight to the EPA Region 7 Science and Technology Center (STC) for analysis. On March 28, 2024, I placed the samples I collected on ice in an ice chest, sealed the container and hand delivered the samples to the EPA Region 7 STC for analysis. I followed Region 7 LSASD standard operating procedures in the collection, packaging, transportation, and handling of the samples. Field Sheets and Chain of Custody forms were electronically submitted each day following Region 7 procedures. Samples shipped on March 26, 2024, arrived to the STC late, and CBOD was not analyzed. All other samples arrived at the STC within proper holding times.

FACILITY DESCRIPTION

The Humboldt WWTF is owned by the City of Humboldt, Nebraska. The city has contracted with PeopleService Inc. to operate the WWTF. The legal description is the NW ¼, NE ¼, Section 10, Township 02 North, Range 13 East within Richardson County Nebraska. The physical address of the WWTF is 1100 S. Railroad Street, Humboldt, NE. The mailing

address is P.O. Box 607, Humboldt, NE. The WWTF treats domestic wastewater from the city of Humboldt. Final effluent from the WWTF is discharged to the North Fork of the Big Nemaha River.

The following are components of the WWTF. See attachment 4 for a layout map of the facility:

Influent Parshall Flume
Headworks which includes a comminuter
Primary Clarifier
Bio-tower
Aeration basin
Final Clarifier
UV Disinfection (not in operation during the inspection)

Biosolids are handled by the following sequence:

Aerobic Sludge Digestion (1)

According to Mr. Chesnut, the biosolids are land applied to agricultural ground not owned by the city.

The facility has a design flow of 0.205 MGD with an actual flow average during the inspection of 0.07 MGD. It was also noted that there is not a flow meter on the effluent and that all flow readings are on the influent.

The WWTF's National Pollutant Discharge Elimination System (NPDES) Permit (NE-0031844) was issued on January 1, 2022 (attachment 5). The permit expires on December 31, 2026.

FINDINGS AND OBSERVATIONS

The following findings were noted during the plant and record review. A complete summary is given in the NPDES Compliance Inspection Report Checklist (attachment 1). These findings were discussed with Mr. Adair during the exit meeting.

Self-Monitoring Data Review:

I obtained a spreadsheet of the NetDMR data for the Humboldt WWTF from January 2021 through March 2024, and reviewed the data. During the inspection, I also obtained an electronic copy of the facility's Discharge Monitoring Reports for the years 2019 – 2023.

Table 1A below represent the effluent violations noted during the review.

Table 1A: Effluent violations at Outfall 001 reported from January 2021 – March 2024

	CBOD	Limits	Ammonia (NH3)	Limits	E.coli	Limits	TSS	Limits
May-21					613.00	126/298		
Jun-21			5.46	2.36/4.74	2420.00	126/298		
Jul-21					2419.60	126/298		
Jan-22			6.27	2.11/4.23				
Feb-22			10.5	2.11/4.23				
Mar-22			9.64	5.54				
Apr-22			13.6	5.54/11.12				
May-22	31	25	17.6	5.54/11.12	2419.60	126/298		
Jun-22			6.49	2.36/4.74				
Nov-22			2.36	2.11				
Dec-22			2.88	2.11				
Jan-23	55.5	25/40	19.6	2.11/4.23				
Feb-23			16.3	2.11/4.23				
Mar-23			11.7	5.54/11.12				
Nov-23			17.2	2.11/4.23				
Dec-23			3.96	0.85/1.7			31	30

Limits are in concentration (mg/L)

I also noted that there were several months that the facility violated the mass limits for Ammonia that are established in the NPDES permit, however, due to a concern in the accuracy of the reporting, those violations are not presented in the above table. At the conclusion of the inspection, during the exit conference, I issued a Notice of Preliminary Findings (NOPF) (attachment 6) to the facility for the continued effluent violations. Mr. Adair responded to the NOPF on April 8, 2024 (attachment 6) and stated that the facility was continuing to improve the effluent quality. He stated that the facility is older and would be working with the city to come up with solutions to fix issues as they are identified.

Sample Results

The analytical results from the sampling conducted during the inspection were received on April 18, 2024, from the Region 7 STC laboratory. This data was not discussed during the exit interview. The analytical results for CBOD, NFS, TKN, Ammonia, Nitrates+Nitrites, Total Nitrogen, Total Phosphorus, metals, pH, and temperature of the samples I collected are presented in Tables 2 and 3 below. See attachment 7 for the analytical data packet.

Table 2A: Analytical Results for Influent

Parameter	(March 26) 2400075-01	(March 27) 2400076-01	(March 28) 240077-01
CBOD₅ (mg/L)¹	NA	143	147
NFS (mg/L)	113	205	174
TKN (mg/L)	28.1	33.1	30.6
Nitrate+Nitrate (mg/L)	0.751	0.376	0.590
Total Nitrogen	28.9	33.5	31.2
Ammonia (mg/L)	18.4	20.8	19.5
Total Phosphorus (mg/L)	3.37	4.51	4.20
Temperature (°C)²	8.5	8.9	10.4
pH³	7.36	7.62	7.44
Flow	0.073	0.074	0.063

¹mg/L = milligrams per liter

²°C = degrees Celsius, Temperature was measured in the field.

³ pH is not to be averaged; pH was measured in the field.

Table 2B: Analytical Results for Effluent Samples Collected During Inspection

Parameter	(March 26) Sample # 2400075-02	(March 27) Sample 2400076-02	(March 28) Sample 2400077-02	Concentration Permit Limits ³
CBOD5 (mg/L) ¹	NA	32.2	42.8	25/40
NFS (mg/L)	5.20	21.0	33.6	30/45
Ammonia (mg/L)	11.8	22.1	20.0	For December 11.12/5.54
TKN (mg/L)	14.0	27.4	28.2	NA
Nitrate+Nitrite (mg/L)	2.91	0.954	0.649	NA
Total Nitrogen (mg/L)	16.9	28.4	28.8	NA
Total Phosphorus (mg/L)	1.06	6.51	6.35	NA
Temperature (°C) ²	7.5	6.3	9.6	NA
pH ²	7.6	8.3	7.79	6.0-9.0
Flow in MGD	NA	NA	NA	NA

¹mg/L = milligrams per liter.

²°C = degrees Celsius, pH is not to be averaged, pH was measured in the field.

³Permit limits for BOD and NFS are Monthly followed by 7-day Averages. Limits for Ammonia are Daily Maximum followed by 30-day average.

Table 3: Analytical Results for Biosolids Sample Collected During Inspection reported as Milligrams per Kilograms (mg/kg)

Parameter	March 28 2400077-03
Aluminum	2850
Antimony	ND
Arsenic*	ND
Barium	123
Beryllium	ND
Cadmium*	ND
Calcium	96800
Chromium	ND
Cobalt	ND
Copper*	76.4
Iron	4990
Lead*	ND
Magnesium	34700

Manganese	213
Molybdenum*	ND
Nickel*	ND
Potassium	51700
Selenium	ND
Silver*	ND
Sodium	60400
Thallium	ND
Vanadium	ND
Zinc*	216
Mercury*	0.708
% Solids	0.192

*40 CFR Part 503 Metals

Results from sampling conducted during the inspection indicate that the facility was not in compliance with daily maximum effluent limits for Ammonia set in the NPDES permit.

Biosolids (sludge)

As mentioned above, the facility utilizes an aerobic digester to treat biosolids generated by the facility. According to Mr. Adair, the facility removes digested biosolids twice per year and land applies on local agricultural land. During the inspection, I observed the digester and noted cracks along the west side of the digester (photos 4-5). It also appeared that the cracks were allowing biosolids to “leak” out of the digester and onto the ground surrounding the digester. I also observed that at the time of the inspection, the upper control valve was leaking biosolids onto the sidewalk around the digester (photos 6-7). Mr. Chesnut stated that the two lower control valves were seized and were not operable at the time of the inspection. At the end of the inspection, I issued a NOPF for the operation and maintenance issues concerning the aerobic digester (attachment 6)

During the inspection, I requested copies of the 2021 – 2024 biosolids reports that include sample results and any land application information. After completion of the inspection, I received copies of biosolids sample results and land application information for 2022 and for the spring and fall of 2023 (attachment 8)

According to the biosolids sampling results provided, the facility meets the Pathogen Reduction requirements for producing “Class B” biosolids by having less than 2,000,000 MPU/CFU of fecal coliform bacteria. It also indicates that meets the vector attraction reduction (VAR) requirement by reducing the volatile solids by 38% or more.

Laboratory

Mr. Chesnut stated that the facility utilizes a contract laboratory, Midwest Laboratories, Omaha, Nebraska, for all other regulatory analysis. During the inspection, I requested the laboratory records to ensure that all analysis complied with requirements of 40 CFR part 136. My review indicated that all holding times were being met and that all analytical methods appeared to be in compliance with 40 CFR Part 136.

Collection System

During the inspection, I discussed the city's collection system with Mr. Chesnut. Mr. Chesnut could not estimate the amount of sewer lines within the city, however, he did estimate that the average age of the system is 90+ years old. He stated that the majority of the city is on a gravity sewer system, however there is a small portion that is on a force main as there is one lift station in town. He stated that a cleaning program was recently implemented and that the plan was to clean $\frac{1}{4}$ of the system each year starting in 2024.

I observed the one lift station (photos 21-22) during the inspection. I observed the wet wells of each station and also noted that each station was well maintained. Mr. Chesnut stated that during rain events, he routinely needs to come down to the lift station and bypass treatment by utilizing a trash pump to pump out the wet well. He stated that he pumps the lift station into a nearby storm sewer line. He stated that this is due to the Inflow and Infiltration problems that they have in this area. I asked if they report the bypassing to the NDEE. Mr. Chesnut was not sure if it was reported or not. I reviewed the available electronic file from NDEE and I noted that there has not been a bypass reported for the lift station since 2019. At the completion of the inspection, I issued a NOPF for not reporting bypassing of the treatment system as required by the permit.

Operational Issues and Observations

1. I observed all areas of the WWTF during the inspection (photos 1-22). I noted several operation and maintenance issues at the WWTF including:
 - i. The secondary clarifier baffles were corroded in several spots with large holes in the baffles in many spots (photos 2-3 & 13-15).
 - ii. The scum arm on the secondary clarifier did not appear to be in operation on March 26, 2024 and March 27, 2024.
 - iii. The scum arm on the primary clarifier did not appear to be in operation throughout the inspection.
 - iv. As previously mentioned, there were cracks in the west digester wall (photos 4-5) and it appears that two out of three control valves were not operable (photo 6).

At the conclusion of the inspection, I issued a NOPF for the operation and maintenance issues at the WWTF (attachment 6).

2. Mr. Chesnut and Mr. Adair stated that the facility only records the influent at the WWTF. The NPDES permit has mass effluent limits which should be calculated with effluent flow readings to get the most accurate reading possible. The NPDES permit states that effluent flow must be measured or calculated, this is to ensure that an accurate mass calculation is conducted. At the conclusion of the inspection, I issued a NOPF for not accurately recording the effluent flow from the facility (attachment 6).
3. The NPDES permit requires that the facility obtain a removal efficiency of 85% or higher for both CBOD and TSS. The NPDES permit only requires that the facility sample the influent once per year. According to Mr. Chesnut and Mr. Adair, the facility only has one automatic composite sampler, so they cannot take the influent and effluent samples on the same day to accurately determine the removal efficiency at the facility. At the conclusion of the inspection, I issued a NOPF for not being able to accurately determine the removal efficiency of CBOD and TSS as required by the NPDES permit (attachment 6).
4. The NPDES permit requires that the facility is to be operated and maintained by a certified operator. Mr. Adair stated that he was the certified operator of record, however, he is not at the facility on a routine basis. Mr. Chesnut stated that although he is not a certified operator, he is at the facility on a daily basis and if issues come up, he can speak with Mr. Adair via telephone. Mr. Chesnut stated that he is working on becoming a certified operator. At the end of the inspection, I issued a NOPF for not having a certified operator at the facility to operate and maintain the facility on a regular basis (attachment 6).

Summary

The Humbolt WWTF continues to have effluent violations for CBOD, NH₃ and E.coli. The facility does not appear to be able to treat wastewater and remove Ammonia on a consistent basis. Sampling conducted during the inspection, indicated violations of the daily limits for Ammonia.

The Humbolt WWTF had several operation and maintenance issues that were identified during the inspection. These included not all of the treatment systems were operating, cracks in the digester, and the baffles in the clarifiers were corroded.

The facility does not have an accurate method to determine removal efficiency as required by the permit. The facility does not have an accurate method to determine the mass limits of the permit, due to not having a flow meter on the effluent.

The facility does have a certified operator of record, however, that person is not on site on a regular basis operating or maintaining the facility. The everyday operator at the facility was not certified at the time of the inspection.

All bypassing events have not been reported to the state as required by the NPDES permit.

**JOSEPH
HEAFNER**
Joe Heafner
Life Scientist

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Attachments:

1. Water Compliance Inspection Report, Form 3560-3 (4 pages)
2. EPA Region 7 Biosolids Checklist (3 pages)
3. Digital Photographs with Photo Log (25 pages)
4. Facility Satellite Photos/Maps (1 pages)
5. NPDES permit issued on January 1, 2022 (25 pages)
6. NOPF and facility response (6 page)
7. Laboratory Analytical Report for Activity JAH2414 (33 pages)
8. Biosolids Reports (77 pages)